

CLAIMS

We claim:

1. A valve section for a multiple section hydraulic valve assembly comprising:
a body having first and second side surfaces and an end surface, a bore extending into the body from the end surface, a plurality of primary mating surfaces raised from locations on the first side surface remote from a region of the first side surface that is adjacent the bore, a plurality of secondary mating surfaces raised from locations on the second side surface remote from a region of the second side surface that is adjacent the bore, wherein the plurality of primary mating surfaces are adapted to mate with a secondary mating surface of another valve section and the plurality of secondary mating surfaces are adapted to mate with a primary mating surface of yet another valve section, the body further including a plurality of common passages spaced from the bore and each extending between one of the plurality of primary mating surfaces and one of the plurality of secondary mating surfaces;
a plurality of passageways connecting the bore to each of the plurality of common passages; and
a control spool slidably received in the bore.

2. The valve section as recited in claim 1 further comprising a plurality of fastener apertures extending between the plurality of primary mating surfaces and the plurality of secondary mating surfaces for securing the valve section to the other valve section.

3. The valve section as recited in claim 1 further comprising an annular groove in one of the plurality of primary mating surfaces and extending around at least one of the plurality of common passages.

4. The valve section as recited in claim 3 further comprising a seal in each annular groove.

5. The valve section as recited in claim 1 further comprising a workport communicating with the bore for connecting a hydraulic conduit to the valve section.

6. A valve section for a multiple section hydraulic valve assembly comprising:
a body having first and second side surfaces and an end surface, a bore extending into the body from the end surface, a first mating surface and a second mating surface both raised from locations on the first side surface that are remote from a region of the first side surface that is adjacent the bore, a third mating surface and a fourth mating surface both raised from locations on the second side surface that are remote from a region of the second side surface that is adjacent the bore, a supply passage and a first tank return passage extending between the first and third mating surfaces, a second tank return passage extending between the second and fourth mating surfaces, all of the supply passage, the first tank return passage and the second tank return passage being remote from the bore;

a first passageway connecting the supply passage to the bore;

a second passageway connecting the first tank return passage to the bore;

a third passageway connecting the second tank return passage to the bore; and

a control spool slidably received in the bore.

7. The valve section as recited in claim 6 further comprising a first fastener aperture and a second fastener aperture for receiving fasteners that secure the valve section to another valve section, the first fastener aperture extending between the first and third mating surfaces and the second fastener aperture extending between the second and fourth mating surfaces.

8. The valve section as recited in claim 6 wherein the first mating surface has a first annular groove around the supply passage, and a second annular groove around the first tank return passage; and the second mating surface has a third annular groove around the second tank return passage.

9. The valve section as recited in claim 8 further comprising a separate seal in each of the first annular groove, the second annular groove, and the third annular groove.

10. The valve section as recited in claim 6 further comprising a fifth mating surface raised from the first side surface; a sixth mating surface raised from the second side surface; and a load sense passage having openings in the fifth and sixth mating surfaces.

11. The valve section as recited in claim 10 further comprising a fourth passageway connecting the load sense passage to the bore.

12. The valve section as recited in claim 11 further comprising a fourth annular groove around the opening of the load sense passage in the fifth mating surface; and a seal in the fourth annular groove .

13. The valve section as recited in claim 6 further comprising a pair of workports communicating with the bore for connecting hydraulic conduits to the valve section.

14. A hydraulic valve assembly comprising a plurality of valve sections abutting side by side, wherein each valve section comprises:

a body having first and second side surfaces and an end surface, a bore extending into the body from the end surface, a first mating surface and a second mating surface both raised from locations on the first side surface that are remote from a region of the first side surface that is adjacent the bore, a third mating surface and a fourth mating surface both raised from locations on the second side surface that are remote from a region of the second side surface that is adjacent the bore, a supply passage and a first tank return passage extending between the first and third mating surfaces, a second tank return passage extending between the second and fourth mating surfaces, all of the supply passage, the first tank return passage and the second tank return passage being remote from the bore;

a first passageway connecting the supply passage to the bore;

a second passageway connecting the first tank return passage to the bore;

a third passageway connecting the second tank return passage to the bore; and

a control spool slidably received in the bore.

15. The hydraulic valve assembly as recited in claim 14 further comprising an end cap attached to the second and fourth mating surfaces of one of the plurality of valve sections and closing the supply passage, the first tank return passage and the second tank return passage.

16. The hydraulic valve assembly as recited in claim 14 further comprising a ported end section attached to the first and third mating surfaces of another one of the plurality of valve sections, and having an inlet port communicating with the supply passage and an outlet port communicating with the first tank return passage and the second tank return passage.

17. The hydraulic valve assembly as recited in claim 14 wherein each valve section further comprises a first fastener aperture extending between the first and third mating surfaces; a second fastener aperture extending between the second and fourth mating surfaces; and further comprising a pair of fasteners extending into the first and second fastener apertures to secure the plurality of valve sections together.

18. The hydraulic valve assembly as recited in claim 14 wherein the first mating surface of each valve section has a first annular groove around the supply passage and a second annular groove around the first tank return passage; and the second mating surface of each valve section has a third annular groove around the second tank return passage; and further comprising a separate seal in each of the first, second and third annular grooves.

19. The hydraulic valve assembly as recited in claim 14 wherein each valve section further comprises a fifth mating surface raised from the first side surface; a sixth mating surface raised from the second side surface; and a load sense passage having openings in the fifth and sixth mating surfaces and coupled to the bore.

20. The hydraulic valve assembly as recited in claim 14 wherein each valve section further comprises a pair of workports communicating with the bore for connecting hydraulic conduits to that valve section.